

REMARKS

In the Office Action, Claims 1-20 were examined. Claims 1-4, 6-15, 17-22 and 24-29 stand rejected and Claims 5, 16, 23 and 30 are objected to. In response to the Office Action, Claims 1-5, 8, 13-15, 19, 21, 22, 26, 28 and 29 are amended, no claims are cancelled and Claims 31-38 are added. Applicant respectfully requests reconsideration of pending Claims 1-38 in view of the following remarks.

I. Objection to Title

The Examiner rejects the title of the invention as not being descriptive. The title of the invention is amended to be indicative and descriptive of the invention. Hence, Applicant respectfully requests that the Examiner withdraw the objection to the title.

II. Claim Objections

Claims 4, 15, 22 and 29 are objected to for the informality of containing the obscure limitation of “operand a register”. In response, Applicant amends Claims 4, 15, 22 and 29 to read:

bypassing execution of an arithmetic instruction having at least one register
as an operand . . .

Accordingly, Applicant respectfully submits that the amendments to Claims 4, 15, 22 and 29 remove the obscurity from the aforementioned claims. Therefore, Applicant respectfully requests that the Examiner reconsider and withdraw the objection to Claims 4, 15, 22 and 29.

III. Claims Rejected Under 35 U.S.C. §102

The Examiner rejects Claims 1-4, 6-11, 19-22 and 24-29 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,799,179 to Ebcioglu et al. (“Ebcioglu”). Applicant respectfully traverses this rejection.

“Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*” Lindemann Maschinenfabrik v. American Hoist & Derrick (“Lindemann”), 730 F.2d 452, 1458 (Fed. Cir. 1994)(emphasis added). Additionally, each and every element of the claim must be exactly disclosed in the anticipatory reference. Titanium Metals Corp. of American v. Banner (“Banner Titanium”), 778 F.2d 775, 777 (Fed. Cir. 1985).

Regarding Claims 1 and 26, Claims 1 and 26 are amended to recite the following claim feature, which is neither taught nor suggested by either Ebcioglu or the references of record:

bypassing execution of instructions having at least one operand with an
associated tag that indicates that the operand is a scratch value.

Conversely, Ebcioglu teaches a technique for:

Minimization of CPU overhead from exceptions from speculative instructions as well as sufficient handling of an exception for a speculative instruction which turns out to be in the taken path. In accordance with the teaching of this invention, an exception from a speculative instruction is processed if and only if it would occur in the original sequential program. (See, col. 3, lines 31-37.)

As defined by Ebcioğlu:

A speculative instruction is an instruction moved above a conditional jump, which determines whether or not the speculative instruction is in the taken path. (See, col. 3, lines 40-44.)

As further described within Ebcioğlu:

[W]here a speculative instruction attempts to use a register having its exception bit set as above . . . , a secondary speculative exception is created and exception tracking includes: (i) setting a target register to point at the speculative instruction address as above; (ii) setting the exception bit of the target register; and (iii) setting the contents of the extra register to the register number of the operand in the speculative instruction rather than the register's contents (and setting the exception bit of the extra exception file). This allows tracking back to the speculative instruction causing the original speculative exception for its resolution. Exception tracking also discards information for speculative exceptions which turn out to be outside the taken path. Speculative exception resolution is triggered when a non-speculative instruction, which is in the taken path, uses an operand from a register having its exception bit set. (See, col. 4, lines 12-28.)

As indicated by the cited passages above, an instruction which uses an operand from a register having its exception bit set either causes a speculative exception resolution or creation of a secondary speculative exception. Conversely, as recited by Claims 1 and 26, instructions which use an operand from a register having an associated tag indicating that the operand is a scratch value causes bypassing of execution of the instructions. According to the Examiner, bypassing of execution of instructions having at least one operand including a scratch value is taught at col. 9, lines 51-63. However, after careful review of the cited passages, Applicant must respectfully disagree with the Examiner's contention. As indicated by the cited passage:

[E]ach time a result is stored into a register, either by a non-speculative instruction or by a speculative instruction which does not cause an exception, the exception bit for that register is reset. (See, col. 9, lines 56-59.)

Applicant respectfully submits that the resetting of the exception bit by non-speculative instructions or speculative instructions, which do not cause an exception, provides no teachings or suggestions with regards to bypassing execution of instructions having at least one operand that is a scratch value, as recited by amended Claims 1 and 26. Accordingly, Applicant respectfully submits that Applicant's amendment to Claims 1 and 26 prohibits the Examiner from establishing a *prima facie* case of anticipation of Claims 1 and 26 since the cited references fail to disclose each and

every element of Claims 1 and 26, as amended. Therefore, Applicant respectfully submits that Claims 1 and 26, as amended, are patentable over Ebcioğlu, as well as the references of record. Consequently, Applicant respectfully requests that the Examiner reconsider and withdraw the §102(b) rejection of Claims 1 and 26.

Regarding Claims 2-4 and 6-7, Claims 2-4 and 6-7 depend from Claim 1 and therefore include the patentable claim features of Claim 1, as described above. Accordingly, Claims 2-4 and 6-7, based on their dependency from Claim 1, are also patentable over Ebcioğlu, as well as the references of record. Consequently, Applicant respectfully requests that the Examiner reconsider and withdraw the §102(b) rejection of Claims 2-4 and 6-7.

Regarding Claims 27-29, Claims 27-29 depend from Claim 26 and therefore include the patentable claim features of Claim 26, as described above. Accordingly, Claims 27-29, based on their dependency from Claim 26, are also patentable over Ebcioğlu, as well as the references of record. Consequently, Applicant respectfully requests that the Examiner reconsider and withdraw the §102(b) rejection of Claims 27-29.

Regarding Claims 8 and 19, Claims 8 and 19 are amended to recite the following claim feature, which is neither taught nor suggested by either Ebcioğlu or the references of record:

an execution engine to bypass execution of instructions having at least one operand with an associated tag that indicates that the operand is a scratch value.

As indicated above with reference to Claims 1 and 26, the resetting of the exception bit for registers by non-speculative instructions or by speculative instructions, which do not cause an exception, provides no teachings or suggestions with regards to bypassing of execution of instructions having at least one operand including a scratch value. Accordingly, Applicant respectfully submits that Applicant's amendment to Claims 8 and 19 prohibits the Examiner from establishing a *prima facie* case of anticipation of Claims 8 and 19 since each and every element of Claims 8 and 19 is not exactly disclosed by Ebcioğlu. *Id.*

Therefore, Applicant respectfully submits that Claims 8 and 19, as amended, are patentable over Ebcioğlu, as well as the references of record. Consequently, Applicant respectfully requests that the Examiner reconsider and withdraw the §102(b) rejection of Claims 8 and 19.

Regarding Claims 9-11, Claims 9-11 depend from Claim 8 and therefore include the patentable claim features of Claim 8, as described above. Accordingly, Claims 9-11, based on their dependency from Claim 8, are also patentable over Ebcioğlu, as well as the references of record. Consequently, Applicant respectfully requests that the Examiner reconsider and withdraw the §102(b) rejection of Claims 9-11.

Regarding Claims 20-22 and 24-25, Claims 20-22 and 24-25 depend from Claim 19 and therefore include the patentable claims of Claim 19, as described above. Accordingly, Claims 20-22 and 24-25, based on their dependency from Claim 19, are also patentable over Ebcioğlu, as well as

the references of record. Consequently, Applicant respectfully requests that the Examiner reconsider and withdraw the §102(b) rejection of Claims 20-22 and 24-25.

IV. Claims Rejected Under 35 U.S.C. §103

The Examiner rejects Claims 12-15, 17 and 18 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,651,125 issued to Witt et al. ("Witt") in view of Ebcioglu. Applicant respectfully traverses this rejection.

To establish a *prima facie* case of obviousness, the following criteria must be met: (1) there must be some suggestion or motivation to modify the reference or combine the reference teachings, (2) there must be a reasonable expectation of success, and (3) the prior art references must teach or suggest all the claim limitations. (MPEP §2142)

Regarding Claim 12, Claim 12 is amended to recite the following claim feature, which is neither taught nor suggested by either Witt, Ebcioglu or the references of record:

an execution engine having a plurality of instructions which when executed cause the processor to perform actions including:

...
bypassing execution of instructions having at least one operand with an associated tag that indicates that the operand is a scratch value.

As indicated above, Ebcioglu is devoid of any teachings with regards to bypassing of execution of instructions having at least one operand including a scratch value, as recited by Claim 12, as amended. The resetting of an exception bit by non-speculative instructions or by speculative instructions, which do not cause an exception, provides no teachings or suggestions with regards to bypassing execution of instructions having at least one operand including a scratch value, as recited by Claim 12, as amended. Furthermore, the Examiner's citing of Witt fails to rectify the deficiencies attributed to Ebcioglu in failing to teach or suggest the bypassing of execution, as recited by Claim 12, as amended.

Accordingly, Applicant respectfully submits that Applicant's amendment to Claim 12 prohibits the Examiner from establishing a *prima facie* case of obviousness since the combination of Witt, in view of Ebcioglu, fails to teach or suggest bypassing of execution of instructions having at least one operand with an associated tag that indicates that the operand is a scratch value, as recited by Claim 12, as amended. Accordingly, Claim 12, as amended, is patentable over the combination of Witt, in view of Ebcioglu, as well as the references of record. Consequently, Applicant respectfully requests that the Examiner reconsider and withdraw the §103(a) rejection of Claim 12.

Regarding Claims 13-15, 17 and 18, Claims 13-15, 17 and 18 depend from Claim 12, and therefore include the patentable claim features of Claim 12, as described above. Accordingly, Claims 13-15, 17 and 18, based on their dependency from Claim 12, are also patentable over the

combination of Witt, in view of Ebcioglu. Consequently, Applicant respectfully requests that the Examiner reconsider and withdraw the §103(a) rejection of Claim 13-15, 17 and 18.

V. Allowable Subject Matter

The Examiner has objected to Claims 5, 16, 23 and 30 are being dependent upon a rejected base claim. In response, Applicant has introduced new Claims 31-34 to incorporate the recited features of Claims 5, 16, 23 and 30 with the features of independent Claims 1, 12, 19 and 26, respectfully. Accordingly, Applicant respectfully requests that the Examiner allow new Claims 31-34.

Regarding new Claims 35-36, new Claims 35-36 recite the following claim features, which are neither taught nor suggested by the references of record:

bypassing execution of instructions having at least one operand with an associated tag that indicates that the operand is a scratch value until at least one instruction is detected that results in a cache miss; and
re-executing bypassed instructions once a cache is loaded with cache miss data.

Accordingly, for at least the reasons described above, Applicant respectfully submits that new Claims 35-38 are patentable over the references. of record. Therefore, Applicant respectfully requests that the Examiner allow new Claims 35-38.

CONCLUSION

In view of the foregoing, it is submitted that Claims 1-38 patentably define the subject invention over the cited references of record, and are in condition for allowance and such action is earnestly solicited at the earliest possible date. If the Examiner believes a telephone conference would be useful in moving the case forward, he is encouraged to contact the undersigned at (310) 207-3800.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§1.16 or 1.17, particularly, extension of time fees.

Respectfully submitted,

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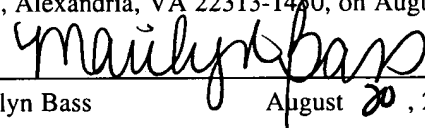
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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, with sufficient postage, in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on August 20, 2004


Marilyn Bass

August 20, 2004